

## Chapter 20

# Participatory GIS for Integrating Local and Expert Knowledge in Landscape Planning

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### ABSTRACT

*This chapter describes the development and implementation of an operational method for integrating expert and local knowledge with new technologies for geographic mapping and communications, to enhance cultural landscape analysis and planning. Topics include the following aspects: a) analysis of type(s) of information required to construct a geographic information system (GIS), with the landscape as a common objective; b) method of implementing and integrating various types of expert knowledge in the GIS; c) method of collecting, organizing, and structuring local knowledge in the GIS; d) method of integrating expert with local knowledge; e) exploration of GIS functions. The main aim of this work is to examine the possibility of using participatory mapping methods and GIS for comparison and integration of multidisciplinary scientific expertise, local knowledge, and landscape project proposals. In particular, it involves specific methods for enhancing local features of vineyard landscapes through a participatory process developed with both vineyard entrepreneurs and the local population. The case study concerns the wine-growing area of Umbria, a region of central Italy.*

### INTRODUCTION

The European Landscape Convention (ELC), which defines the landscape as “an area as per-

ceived by people, whose character is the result of the action and interaction of natural and/or human factors”, introduces two levels of evaluation, of equal importance: objective (“the area”) and subjective (“as it is perceived by people”)

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(Lambertini, 2009). Consequently, landscape perception by locals becomes a focal point in landscape definition, analysis and interpretation (European Council, 2000). In this respect, the ELC promotes participation and raising of awareness in local populations by means of direct involvement in transdisciplinary planning (Antrop and Sevenant, 2009). Three aspects are believed to be important, if regional resource management is to be meaningful to the inhabitants involved (Brunckhorst et al., 2005): 1) to define the areal proportion of the region which inhabitants consider to be part of their “community”; 2) to select landscape units within the region with a high degree of homogeneity, which increases the coincidence of interest among the inhabitants; 3) to consider externalities of resource use. In addition, in the last twenty years, participatory GIS (P-GIS) has been widely used for participatory spatial planning (PSP), assuming that this use of GIS is a tool for better governance (McCall, 2003).

This chapter investigates the validity of participatory mapping methods and GIS for landscape planning of vineyard areas in central Italy. It attempts to answer the following questions: a) what type(s) of information are required to construct a geographic information system (GIS) with the landscape as a common objective? b) how can the various types of expert knowledge be implemented and integrated in the GIS? c) how can local knowledge be collected, organized and structured in the GIS? d) how can expert and local knowledge be integrated? e) how can GIS functions be exploited in order to improve landscape understanding and communications?

The chapter begins in Section 2, describing the background of participatory GIS methods. Section 3 discusses the goals, conceptual and methodological approaches, and summarizes the field surveys and specific analyses performed. Section 4 considers the procedures followed to inform and consult local people for landscape planning, integrating scientific and common local knowledge. Section 5 considers the procedures

followed to involve and collaborate with local people, in order to improve a landscape master plan. Sections 6 to 8 draw some conclusions about the potential of P-GIS to make landscape governance easier, and outline possible future research directions.

## **PARTICIPATORY GIS (P-GIS) METHODS**

Landscape planning problems are often complex, require the contribution of experts from differing fields, engage both private and public institutions, involve stakeholders in diverging interests and, generally, affect a large number of people (Voss *et al.*, 2004). As highlighted in the European Landscape Convention (ELC), landscape perception by locals becomes a focal point in landscape analysis and interpretation (European Council, 2000). Thus, their participation becomes an increasingly important component in landscape decision-making (Vajjhala, 2006). In traditional planning, local communities are not directly involved in landscape analysis, and they may express their opinions only during the final phase of participation. Conversely, modern participatory spatial planning (PSP) is based on the involvement of citizens and other stakeholders in the various phases of the process. In the PSP approach, participants may influence the final contents of the plan and have the opportunity to enhance their awareness about the characteristics and values of “their” landscapes. Participation may have a variety of additional goals, from the building of relationships (as in communicative planning) to prescription or goal selection (as in instrumental rationality) (Talen, 2000).

A multiplicity of participatory approaches exists, aiming at involving the public and integrating local experiences and preferences with experts’ scientific knowledge within the planning process. One effective method is to use mapping and spatial information technologies, such as geographic

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